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This index covers all technical items — papers, correspondence, reviews, etc. — that appeared in this periodical during 1991, and items from previous years that were commented upon or corrected in 1991.

The *Author Index* contains the primary entry for each item, listed under the first author's name, and cross-references from all coauthors. The *Subject Index* contains several entries for each item under appropriate subject headings, and subject cross-references.

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- experimental research in computer architecture . *C-M Jan 91* 14-89
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Spectral analysis
- real-time biomedical signal and image processing using systolic array systems. *Manolakos, Elias S., + , C-M Mar 91* 33-43

Speech processing
- ΦDM-Dialog system for speech-to-speech translation and simultaneous interpretation. *Kitano, Hiroaki, C-M Jun 91* 36-50

Standards
- ethical analysis of responsibility for computer failures in critical systems (Standards). *McFarland, Michael C., C-M Feb 91* 72-75†
- hardware, algorithm, and standards advances in interactive digital multimedia systems. *Fox, Edward A., C-M Oct 91* 9-21
- HyTime standard for structured hypermedia interchange (Standards). *Goldfarb, Charles F., C-M Aug 91* 81-84
- preparing for EC 1992 in the US through quality system registration (Standards). *Tiratto, Joseph, C-M Apr 91* 70-72
- rectifiers suggested to stop magnetic fields when using electric blankets (Addenda to 'A standard for extremely low frequency magnetic fields *C-M apr 90* 95-97). *Buckley, Fletcher J., C-M Jan 91* 98†
- software productivity problems caused by the physical configuration audit standard (Standards). *Buckley, Fletcher J., C-M Jan 91* 97-98†
- standards for electronic data interchange system of intercompany business data transmission (Standards). *Payne, Robert A., C-M Nov 91* 68-70

Standards; cf. ISO; Software standards

Stochastic processes; cf. Markov processes

Supercomputers
- design of 250 MHz microsupercomputer using GaAs DCFL and multichip-module packaging. *Mudge, Trevor N., + , C-M Jan 91* 57-64

Synchronization
- Acme continuous media I/O server and synchronization mechanism. *Anderson, David P., + , C-M Oct 91* 51-57

Synchronization; cf. Timing

Systolic arrays
- real-time biomedical signal and image processing using systolic array systems. *Manolakos, Elias S., + , C-M Mar 91* 33-43

T

Technology forecasting
- past and future developments in computer networks and distributed systems. *Wittie, Larry D., C-M Sep 91* 67-76
- promise of the next decade (special issue). *C-M Sep 91* 15-16, 18-96
- user-interface developments for 1990s. *Marcus, Aaron, + , C-M Sep 91* 49-57
- viewpoints on current and future technology from 15 academic and industry leaders. *Treleaven, Philip, + , C-M Sep 91* 98-113

Technology social factors
- book review; Microcosm: The Quantum Revolution in Economics and Technology. *Hammerton, James C., C-M Nov 91* 111
- predictions concerning effects of world-wide computer failures (The Open Channel). *Pickover, Clifford A., C-M Sep 91* 152

Teleconferencing
- Phoenix extension to multimedia conferencing in Etherphone environment. *Vin, Harrick M., + , C-M Oct 91* 69-79

Text processing
- Lilac system offering WYSIWYG editing and language-based document description. *Brooks, Kenneth P., C-M Jun 91* 7-19

Text processing; cf. Document handling

Time synchronization; cf. Synchronization

Timing
- partially ordered logical clocks for analysis and control of computations on distributed computing systems. *Fidge, Colin, C-M Aug 91* 28-33

Trade; cf. Business...

Transaction processing systems; cf. Database systems; Distributed database management systems

Transducers; cf. Multisensor systems

U

Uncertain systems; cf. Fuzzy set theory

United States
- preparing for EC 1992 in the US through quality system registration (Standards). *Tiratto, Joseph, C-M Apr 91* 70-72

United States; cf. Governmental activities/factors

User-interface management systems
- COMET system automating generation of coordinated multimedia text and graphic explanations. *Feiner, Steven K., + , C-M Oct 91* 33-41

User interfaces; cf. Computer interfaces

V

Very-large-scale integration
- implementation of PIPE (parallel instruction with pipelined execution) VLSI processor architecture. *Farrens, Matthew K., + , C-M Jan 91* 65-70

Videoconferencing; cf. Teleconferencing

Vision systems (non-biological); cf. Robots, vision systems

Visual languages
- book review; Principles of Visual Programming Systems (Chang, S.-K.; 1990). *Wynn, Jackson E., C-M Jan 91* 149-150

Visual system
- microcomputer-based monitor using internal model to track eye. *Myers, Glenn A., + , C-M Mar 91* 14-21†

Visualization
- book review; Envisioning Information'(Tufte, E.; 1990). *Comte, Chris, C-M May 91* 118-119
- book review; Visualization: The Second Computer Revolution (Friedhoff, R. M., and Benzon, W.; 1989). *Renteria, Enrique, C-M Sep 91* 151

Visualization; cf. Scientific visualization

VLSI; cf. Very-large-scale integration

W

Word processing; cf. Text processing

> **"Any clod can have the facts, but having opinions is an art."**
> Charles McCabe, San Francisco Chronicle

THE OPEN CHANNEL

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Rules for concurrent engineering — Part II

In Part I last month, I said that teamwork is continually underemphasized and discussed the three basics of successful engineering teams: trust, teamwork, and confidence. Once organized, a team formulates its planning strategy or master plan. It is during this planning stage that the team "gels" and begins implementing the master plan.

The master plan is quite detailed and well thought out, since it lists all issues and interdependencies between team members. Complex events are meticulously scheduled to take advantage of "the system" in ways that yield major cost and time savings. Furthermore, because the plan is created by experts on the company, there are often some surprises (both good and bad) that speak to the realities of a company's development process. Sometimes the team will recognize a deficiency and ask that additional elements of the company be represented on the team or excuse some elements deemed extraneous. If the team decides not to continue, it is usually correct.

Once the plan and detailed specification have been completed and approved, the team begins work in earnest. All necessary "homework" has been done, so critical paths and risks have been isolated. The team knows what to look out for. Now the company must assist the team without meddling. Since concurrent engineering yields much faster development cycles than serial methods, specification changes (mid-course corrections) are seldom justified. However, when necessary, these changes must be handled very carefully to maintain the always-fragile team atmosphere. Fortunately, the team usually recognizes the need or opportunity to change before management does.

How to make the system fail. Having managed with some variation on this technique for a number of years, I can say that it works well when given a chance. There are, however, some ways to make the system fail spectacularly. Here are 10:

(1) Keep morale low. This is a team killer.
(2) Keep turnover high. Don't let the team gel.
(3) Constantly review the schedule or specification. Even when no changes are made, this kills team confidence in management and tells the team that they are not respected, leading to (1) and (2) above. Turning reviews into "fire drills" is even more destructive.
(4) Change the schedule, goal, or specification after work has begun. Repeat as necessary until failure occurs.
(5) Break any "implied commitments" with the team, such as tools availability or manpower promises.
(6) Ignore the team's choice for its leader.
(7) Reward only the team's leader and/or a few stars.
(8) Deny the team its necessary autonomy, symbols, and pride.
(9) Make the manager or company lose credibility with the team.
(10) Fail to empower the team or any member of it. Better yet, empower everyone but the representative from one of the smaller elements; the best way is to leave a crucial portion of the company out of the team altogether. The team will ultimately fail but appear to be working up until the last moment.

Managing a development of this type is not for the faint of heart. Traditional management tools can easily be misapplied with disastrous results. A successful manager must force lower level decision-making and constantly avoid the temptation to make decisions for team members. Furthermore, anti-team behavior must not be tolerated.

A successful team must be rewarded *as a team*. Only after the team is rewarded should outstanding individual contributions be acknowledged. The team must influence the choice of individuals to be rewarded. Lastly, the manager must understand that he or she is not a member of the team.

Autonomy and leadership. A development team of this type often virtually runs itself, freeing the manager to run ahead clearing obstacles. However, it is crucial to maintain a degree of day-to-day accountability in terms of progress against schedules, open issues to be dealt with, and personnel mix (making sure that the necessary skills sets are represented in the proper proportion within the team).

Once a manager becomes comfortable with this development style, it becomes easy to manage several teams concurrently. In fact, the teams will consult each other to optimize their plans in the light of resource constraints posed by other teams. This degree of self-management can at once be both wonderful and scary. When the entire organization becomes comfortable with the concurrent engineering and team concepts, new challenges must be faced, including interteam rivalries and personnel raids.

Concurrent engineering is a vital area of technology development. Development teams are the heart of any successful concurrent engineering program. The key to having an effective team is to have a supportive atmosphere based on mutual respect and responsibility. Without this, cabinets full of schematics and reams of code will not make a development successful.

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CALL FOR PAPERS

17th Annual Conference on Local Computer Networks

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The focus of the 17th LCN will be on the issues and problems of large LCNs/LANs/MANs/WANs. Many approaches, both managerially and technically, that are suited to small networks do not scale up to large networks. Different techniques/products are required. Papers that cover these areas are explicitly sought and will be given preference.

Information for Authors:
All authors must submit 5 full copies of the full technical paper. The first page must contain: title of the paper, author's names including affiliations, complete mailing address, telephone and FAX numbers, Internet or Bitnet address, and a 250 word (maximum) abstract (double-spaced) in English to Steve Bell, Program Chair, at the address below:

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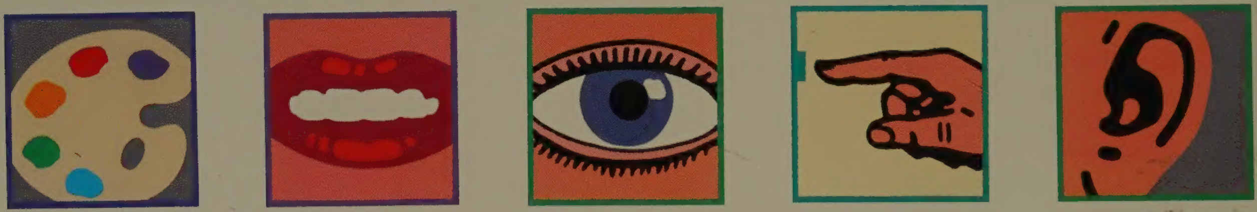

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